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論文審査担当者	主査：　村上 信五 副査：　山崎 小百合，新実 彰男

Abstract

Periostin is a matricellular protein that is involved in the pathophysiology of upper airway diseases [UADs, primarily allergic rhinitis and chronic rhinosinusitis (CRS)] and asthma. Associations of serum periostin with systemic/airway eosinophilic inflammation and comorbid CRS in patients with asthma have been demonstrated. Although serum periostin is positioned as a marker of type 2 immunity, its implication in comorbid UADs in patients with asthma remains unclear. We sought to investigate the utility of serum periostin as a diagnostic biomarker in UADs in patients with asthma. We prospectively enrolled 65 patients with stable asthma; 20 without UADs, 22 with rhinitis, 23 with CRS [13 with nasal polyps (NPs), 10 without], between July 2014 and December 2015. Serum periostin, eotaxin and total IgE; fractional exhaled nitric oxide (FeNO) and blood–sputum eosinophil levels were measured and compared between UAD subtypes. We evaluated the utility of each biomarker in detecting UADs, associations among each biomarker, severity of rhinitis and CRS as measured by the Lund–Mackay score (LMS) for sinus computed tomography. Serum periostin levels were higher in asthmatic patients with CRS (109.6 ± 47.4 ng/ml) than those without UADs (83.2 ± 22.9) ($p = 0.04$). Serum periostin levels in asthmatic patients with CRS with nasal polyps (NP) were significantly higher (130.0 ± 46.6) than those without NP (87.9 ± 37.7) ($p = 0.001$). Serum periostin levels were not associated with the presence or the severity of rhinitis. In contrast, receiver operating characteristic curve analyses showed moderate diagnostic accuracy for detecting CRS [area under the curve (AUC) = 0.71, $p = 0.01$], and high accuracy for CRSwNP (AUC = 0.86, $p = 0.0002$). Furthermore, when comparing patients with comorbid CRSwNP to those with comorbid CRSsNP, serum periostin was found to be the sole biomarker for detecting the presence of NP. Serum periostin was also the sole biomarker which significantly correlated with LMS in patients with CRS ($r = 0.44$, $p = 0.04$). We concluded that serum periostin is useful for detecting CRSwNP and reflecting radiological CRS severity in patients with asthma.